Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

ALL-PURPOSE REMOTE TRANSPORT SYSTEM SUPPORTS FORCE PROTECTION AND ACTIVE RANGE CLEARANCE ACTIVITIES

The All-purpose Remote Transport System (ARTS) provides the warfighter with a robust suite of tools to accomplish force protection and active range clearance activities. It allows the warfighter to stay out of harm's way since no human is onboard. All of the ARTS components are commercial off-the-shelf items designed to withstand intense conditions.

The vehicle's components allow technicians to make quick and inexpensive repairs when damage does occur and move the vehicle control computer and software package from one vehicle platform to the next, reducing duplication of effort while maximizing commonality across all platforms. The removal of the operator from the hazard area also reduces the requirement for expensive and bulky armor plating.

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Accomplishment

Engineers at the Materials and Manufacturing Directorate developed a low-cost, survivable platform capable of remote operations in a variety of mission profiles. ARTS, developed in cooperation with Headquarters Air Combat Command and the 99th Civil Engineering Group, Nevada Test Range, already established its value during range clearance operations and demonstrated great potential for success in force protection, fire fighting, natural disaster cleanup, inclimate weather operations, range remediation, and active range clearance.

Background

Following the tragic incident at Khobar Towers in June 1996, Air Force officials identified a need for the ability to safely remove or disable terrorist bombs. Systems used at this time were too small to remove these improvised explosive devices or disable weapons of mass destruction in such incidents, so the directorate's Airbase Technologies Division began working on alternatives.

The division's Robotics Research Group, part of the Office of the Secretary of Defense Joint Robotics program, coordinates the Air Force effort to develop robotic technologies and systems that provide land forces with highly mobile, multi-mission, unmanned ground vehicles to achieve leap-ahead capabilities across a wide spectrum of mission challenges. With the support of a contract team, the directorate immediately sought to develop technology to respond to these critical real-world situations.

The ARTS is a modified version of a standard light construction tractor, the Posi-Track™ MD70, manufactured and distributed by All Season Vehicle, Inc., Grand Rapids, Minnesota. The platform has a four-cylinder, liquid-cooled diesel engine that delivers power to the 18-inch wide, Kevlar-reinforced rubber tracks through a dual hydrostatic transmission.

The tracks have over 3,000 square inches of contact area, resulting in ground contact pressure of approximately 2 pounds-per-square-inch. This vehicle profile allows for a low center of gravity and light footprint, which makes the rugged and reliable vehicle the perfect candidate for range operations by minimizing forces that could detonate sensitive munitions.

The Air Force has seen significant success for ARTS, as explosive ordnance disposal (EOD) specialists have used it for unexploded ordnance clearance and remediation. The Air Force currently operates several active bombing ranges where pilots train by dropping advanced and lethal anti-armor/anti-personnel weapons. EOD specialists must periodically clear debris such as bomb fragments, unexploded munitions, and other hazardous items.

Materials and Manufacturing
Support to the Warfighter

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-ML-07)